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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/028,978	12/28/2001	Tetsuya Kondo	21994/00036	3742

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Morris Liss
Connolly Bove Lodge & Hutz LLP
Suite 800
1990 M Street, N.W.
Washington, DC 20036-3425

EXAMINER	
BATTAGLIA, MICHAEL V	
ART UNIT	**PAPER NUMBER**
2652	7

DATE MAILED: 07/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/028,978	KONDO ET AL.	
	Examiner	Art Unit	
	Michael V Battaglia	2652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 December 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

4. Claim 8 is objected to because of the following informality. On line 2 of claim 8, replacing "recording" with -reproducing– is suggested to avoid insufficient antecedent basis issues. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 7 and 9 and therefore 2-6 and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject

matter which applicant regards as the invention. It is unclear how a unitless numerical aperture can be larger than two lengths (wavelength and pitch) to satisfy the relationship $P < \lambda < NA$. A numerical aperture within the range 0.75 to 0.9 will interpreted as meeting the numerical aperture limitation of claims 1, 7 and 9 in the prior art rejections below.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4 and 6 are rejected under 35 U.S.C. 103(a) as obvious over Ohgo (US 6,269,072) in view of Takeda et al (hereafter Takeda) (US 6,512,735).

In regard to claim 1, Ohgo discloses an information recording medium at least comprising: a substrate having a microscopic pattern (Fig. 1, element 2), which is constituted by a shape of continuous substance of approximately parallel grooves formed with a groove section and a land section alternately (Col. 16, lines 17-19); a recording layer formed on the microscopic pattern (Col. 16, lines 24-26); and a light transmission layer (Fig. 1, element 6) formed on the recording layer, the information recording layer is characterized in that the microscopic pattern is formed so as to satisfy a relations of $P < \lambda$ (Col. 16, lines 19-20 and 38-39) and $0.9 \geq NA \geq 0.75$ (Col. 16, line 37), wherein P is a pitch of the groove section or the land section, λ is a wavelength of reproducing light beam and NA is a numerical aperture of objective lens. It is noted that Ohgo discloses the thickness of the light transmission layer to be 0.1 mm and within a range of 0.07 to 0. 12 mm (Col.

10, line 41; Col. 12, lines 34-35; and Col. 13, lines 41-42) and that Ohgo does not disclose any thickness of the light transmission layer (Fig. 1, element 6) other than 0.1mm. However, Ohgo does not specifically disclose the thickness of the light transmission layer used in Embodiment 9, which is the embodiment used in the present rejection.

Takeda teaches that by using a light transmission layer with a thickness of 0.1 mm and within a range of 0.07 to 0. 12 mm, it is possible to use an objective lens having a high numerical aperture with the information recording medium, reduce the laser spot size, and have an increased recording density.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the thickness of the light transmission layer in the information recording medium of Ohgo be within a range of 0.07 to 0.12 mm as suggested by Takeda, the motivation being to have a thickness of the light transmission layer of Ohgo that works with the high numerical aperture of Ohgo and to, as a result, have increased recording density.

In regard to claim 2, Ohgo discloses that a record based on at least one of reflectivity difference and phase difference is performed onto either one of the groove section and the land section (Col. 3, lines 66-67 and Col. 9, lines 25-30).

In regard to claim 3, Ohgo discloses that the wavelength λ is within a range of 350 to 450 nm (Col. 16, lines 38-39) and the numerical aperture NA is within a range of 0.75 to 0.9 (Col. 16, line 37).

In regard to claim 4, Ohgo discloses that recording in accordance with at least one of the reflectivity difference and the phase difference is performed (Col. 9, lines 25-30). Ohgo does not disclose that the recording is performed so as for the modulated amplitude to be more than 0.4.

Applicant defines a modulated amplitude as a mathematical relationship in the form of a ratio (Page 62, lines 15-19). Examiner concludes that this mathematical relationship is known. Examiner interprets the specification (JIS Standard X6241: 1997) as establishing a range of values for the terms of the mathematical relationship (I14H and I14L), hence establishing a range of modulated amplitudes.

In keeping with In re Peterson (65 USPQ2D 1379), it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the range of modulated amplitudes, the motivation being the inherent improvement of the optimization. Applicant's cooperation is respectfully requested in completing the search report by providing the Office with JIS Standard X6241: 1997.

In regard to claim 6, Ohgo discloses that the recording layer is formed by a phase change material (Col. 16, lines 24-26).

7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohgo in view of Takeda as applied to claim 2 above, and further in view of Misawa et al (hereafter Misawa) (US 5,948,593).

Ohgo discloses that recording in accordance with at least one of the reflectivity difference and the phase difference is performed (Col. 9, lines 25-30). Ohgo does not disclose that the recording is performed so as for the modulated amplitude to be more than 0.4.

Misawa discloses a modulated amplitude of 0.65 that is more than 0.4 and teaches that this value is good (Col. 54, lines 5-6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to perform recording on the information recording medium of Ohgo in view

of Takeda so that the modulated amplitude is more than 0.4 as suggested by Misawa, the motivation being to perform recording with a modulated amplitude value that is good.

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohgo in view of Takeda as applied to claim 2 above, and further in view of Watanabe et al (hereafter Watanabe) (US 4,651,172).

Ohgo discloses that recording in accordance with at least one of the reflectivity difference and the phase difference is performed (Col. 9, lines 25-30). Ohgo or, in the alternative, Ohgo in view of Takeda do not disclose that the recording is performed so as for the reflectivity to be more than 5%.

Watanabe teaches that when recording is performed with a reflectivity of less than 5%, the intensity of reflected light becomes lower and the signal/noise ratio of the reproduced signal deteriorates (Col. 2, lines 61-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to perform recording on the information recording medium of Ohgo in view of Takeda so that the reflectivity is more than 5% as suggested by Watanabe, the motivation being for the intensity of reflected light to be high enough that the signal/noise ratio of the reproduced signal does not deteriorate.

9. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohgo in view of Takeda and further in view of Yamamoto et al (hereafter Yamamoto) (US 6,721,259).

Ohgo discloses an information recording medium at least comprising: a substrate having a microscopic pattern (Fig. 1, element 2), which is constituted by a shape of continuous substance of approximately parallel grooves formed with a groove section and a land section alternately (Col. 16, lines 17-19); a recording layer formed on the microscopic pattern (Col. 16, lines 24-26); and a

light transmission layer (Fig. 1, element 6) formed on the recording layer, wherein the information recording layer is characterized in that the microscopic pattern is formed so as to satisfy a relations of $P < \lambda$ (Col. 16, lines 19-20 and 38-39) and $0.9 \geq NA \geq 0.75$ (Col. 16, line 37), wherein P is a pitch of the groove section or the land section, λ is a wavelength of reproducing light beam and NA is a numerical aperture of objective lens. It is noted that Ohgo discloses the thickness of the light transmission layer to be 0.1 mm and within a range of 0.07 to 0. 12 mm (Col. 10, line 41; Col. 12, lines 34-35; and Col. 13, lines 41-42) and that Ohgo does not disclose any thickness of the light transmission layer (Fig. 1, element 6) other than 0.1mm. However, Ohgo does not specifically disclose the thickness of the light transmission layer used in Embodiment 9, which is the embodiment used in the present rejection.

Takeda teaches that by using a light transmission layer with a thickness of 0.1 mm and within a range of 0.07 to 0. 12 mm, it is possible to use an objective lens having a high numerical aperture with the information recording medium, reduce the laser spot size, and have an increased recording density.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the thickness of the light transmission layer in the information recording medium of Ohgo be within a range of 0.07 to 0.12 mm as suggested by Takeda, the motivation being to have a thickness of the light transmission layer of Ohgo that works with the high numerical aperture of Ohgo and to, as a result, have increased recording density. Ohgo in view of Takeda does not disclose a reproducing apparatus for reproducing from the information recording medium. It is noted that the information recording medium of Ohgo is supported on a turntable (Fig. 1, element 4) while rotating.

Yamamoto discloses a reproducing apparatus for reproducing from an information recording medium, the reproducing apparatus comprising: a pickup (Figs. 10 and 11, element 10) composed of a light emitting element (Col. 14, lines 45-46) having a wavelength of λ within a range of 350 to 450 nm (Col. 22, lines 22-23) and an objective lens (Fig. 10, element 20) having a numerical aperture of NA within a range of 0.75 to 0.9 (Cols. 19-20, Table 4 and Col. 3, lines 1-3) for reading out reflected light from the information recording medium; a motor (Fig. 11, element 31) for rotating the information recording medium; servo means (Fig. 11, element 32) for controlling to drive the pickup and the motor; a turntable (inherent because the information recording medium must be supported while rotating) for supporting the information recording medium while rotating; demodulator means (Fig. 11, element 33) for demodulating an information signal read out by the pickup; interface (I/F) means (Fig. 11, element 33) for transmitting a signal demodulated by the demodulator externally; and controlling means (Fig. 11, element 35) for controlling the reproducing apparatus totally (Col. 16, lines 48-49).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to reproduce from the information recording medium of Ohgo in view of Takeda using the reproducing apparatus of Yamamoto, the motivation being to reproduce information recorded on the information recording medium.

10. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohgo in view of Takeda and further in view of Yamamoto as applied to claim 7 above, and further in view of Tsukihashi (US 6,496,458).

Ohgo in view of Takeda and further in view of Yamamoto as applied to claim 7 doese not disclose that the reproducing apparatus further comprises an auxiliary information demodulator for demodulating a differential signal outputted from the pickup.

Tsukihashi discloses an auxiliary information demodulator (Fig. 1, element 18) for demodulating a differential signal outputted from the pickup (Col. 3, lines 27-33). It is noted that the push-pull signal output from the pickup (Fig. 1, elements 1 and 2) is a differential signal.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate into the reproducing apparatus of Ohgo in view of Takeda and further in view of Yamamoto the auxiliary information demodulator of Tsukihashi, the motivation being to take advantage of auxiliary information stored on a disc and to make the reproducing apparatus of Ohgo in view of Takeda and further in view of Yamamoto compatible with information recording mediums that have wobble signals recorded thereon.

11. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohgo in view of Takeda in further view of Yamamoto and in further view of Tsukihashi.

Ohgo discloses an information recording medium at least comprising: a substrate having a microscopic pattern (Fig. 1, element 2), which is constituted by a shape of continuous substance of approximately parallel grooves formed with a groove section and a land section alternately (Col. 16, lines 17-19); a recording layer formed on the microscopic pattern (Col. 16, lines 24-26); and a light transmission layer (Fig. 1, element 6) formed on the recording layer, wherein the information recording layer is characterized in that the microscopic pattern is formed so as to satisfy a relations of $P < \lambda$ (Col. 16, lines 19-20 and 38-39) and $0.9 \geq NA \geq 0.75$ (Col. 16, line 37), wherein P is a pitch of the groove section or the land section, λ is a wavelength of reproducing light beam and

NA is a numerical aperture of objective lens. It is noted that Ohgo discloses the thickness of the light transmission layer to be 0.1 mm and within a range of 0.07 to 0. 12 mm (Col. 10, line 41; Col. 12, lines 34-35; and Col. 13, lines 41-42) and that Ohgo does not disclose any thickness of the light transmission layer (Fig. 1, element 6) other than 0.1mm. However, Ohgo does not specifically disclose the thickness of the light transmission layer used in Embodiment 9, which is the embodiment used in the present rejection.

Takeda teaches that by using a light transmission layer with a thickness of 0.1 mm and within a range of 0.07 to 0. 12 mm, it is possible to use an objective lens having a high numerical aperture with the information recording medium, reduce the laser spot size, and have an increased recording density.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the thickness of the light transmission layer in the information recording medium of Ohgo be within a range of 0.07 to 0.12 mm as suggested by Takeda, the motivation being to have a thickness of the light transmission layer of Ohgo that works with the high numerical aperture of Ohgo and, as a result, to have increased recording density. Ohgo in view of Takeda do not disclose a recording apparatus for recording an original information signal on the information recording medium. It is noted that the information recording medium is supported on a turntable (Fig. 1, element 4) while rotating.

Yamamoto discloses a recording apparatus comprising: a pickup (Figs. 10 and 11, element 10) composed of a light emitting element (Col. 14, lines 45-46) having a wavelength of λ within a range of 350 to 450 nm (Col. 22, lines 22-23) and an objective lens (Fig. 10, element 20) having a numerical aperture of NA within a range of 0.75 to 0.9 (Cols. 19-20, Table 4 and Col. 3, lines 1-3)

for reading out reflected light from and recording on the information recording medium; a motor (Fig. 11, element 31) for rotating the information recording medium; servo means for controlling to drive the pickup and the motor; a turntable (inherent because the information recording medium must be supported while rotating) for supporting the information recording medium while rotating; interface (I/F) means (Fig. 11, element 33) for receiving the original information signal to be recorded; modulator means (Fig. 11, element 33) for modulating the original information signal; waveform converter (Fig. 11, element 33) means for converting the original information signal into a format suitable for a recording characteristic of the recording layer of the information recording medium (Col. 16, line 67-Col. 17, line 3); and controlling means (Fig. 11, element 35) for controlling the recording apparatus (Col. 16, lines 48-49).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to record an original information signal on the information recording medium of Ohgo in view of Takeda using the recording apparatus of Yamamoto, the motivation being to record original information on the information recording medium. Ohgo in view of Takeda and further in view of Yamamoto does not disclose that the recording apparatus comprises an auxiliary information demodulator means for demodulating a differential signal outputted from the pickup.

Tsukihashi discloses an auxiliary information demodulator (Fig. 1, element 18) for demodulating a differential signal outputted from the pickup (Col. 3, lines 27-33). It is noted that the push-pull signal output from the pickup (Fig. 1, elements 1 and 2) is a differential signal.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate into the recording apparatus of Ohgo in view of Takeda and further in view of Yamamoto the auxiliary information demodulator of Tsukihashi, the motivation being to take advantage of auxiliary information stored on a disc and to make the recording

apparatus of Ohgo in view of Takeda and further in view of Yamamoto compatible with information recording mediums that have wobble signals recorded thereon.

Citation of Relevant Prior Art

12. Ohkubo et al (US 6,590,857) discloses an information recording medium with a substrate having a microscopic pattern of parallel grooves and lands, a phase change recording layer, a light transmission layer, a groove pitch of 280nm, a reproducing wavelength of 375-415nm, an objective lens with an NA of 0.8-0.9, and modulated amplitude of 0.6 or greater (Fig. 3). Komaki et al (US 6,667,952) provides motivation to have light transmission layer with a thickness between 0.07 and 0.15 mm (Col. 6).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael V Battaglia whose telephone number is (703) 305-4534. The examiner can normally be reached on 5-4/9 Plan with 1st Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T Nguyen can be reached on (703) 305-9687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

M. Battaglia

Michael Battaglia

HOA T. NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600
6/27/04